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\$500 the first year, \$750 the second year, and \$1,000 the third year. Such fellows will spend half their time in the private clinic of Dr. Todd or Dr. Burch, and the other half in laboratory and clinical work and in pursuit of certain courses for specialists in ophthalmology and otolaryngology at the university. For work done in these private clinics, credit will be given toward the degree granted by the university in the course of ophthalmology and otolaryngology given at the University of Minnesota, to accepted doctors of medicine covering a period of three years which prepares the physician for the specialty of ophthalmology and otolaryngology.

THE department of architecture of the University of Illinois is planning to take a leading part in rebuilding storm-stricken Mattoon. Sixteen architects of this department are to draw up sixteen standard plans for houses, the cost of which will range from \$800 to \$1,400. This work is being done in line with the school for city planning now being arranged for the coming summer. Officers of the university have expressed the hope that the institution may have an opportunity to duplicate on a larger scale in France what is now being done in the city of Mattoon.

PROFESSOR G. H. CLEVINGER, of Stanford University, has been appointed research professor in metallurgy and has been released from elementary and routine teaching.

PROFESSOR JOHN R. ALLEN, head of the department of mechanical engineering of the University of Michigan, has been offered the deanship of the college of engineering and architecture of the University of Minnesota.

MISS PAULINE H. DEDERER, instructor in zoology at Barnard College, has resigned to become assistant professor in biology at the Connecticut College for Women, New London.

DR. P. G. H. BOSWELL, lecturer in geology at the Imperial College of Science and Technology, London, has been appointed the first holder of the George Herdman chair of geology in the University of Liverpool. The establishment of a chair of geology in the university has been long delayed, and is now

possible owing to the generosity of Professor and Mrs. Herdman, who have endowed the chair as a memorial to their son, the late Lieutenant George Herdman.

DISCUSSION AND CORRESPONDENCE

THE PHYSIOGRAPHY OF THE LOWER AMAZON VALLEY AS EVIDENCE BEARING ON THE CORAL REEF PROBLEM

THE recent revival of the discussion of the origin of coral reefs¹ has raised many questions which involve not only the coral islands, but also the displacements of the strand lines of the continents throughout the tropics, for the changes in level of the tropical seas invoked by Daly must have been recorded on the continents as well as on the islands. It seems, therefore, that a thorough investigation of at least a considerable number of critically situated continental strands of the tropics must be made before the evidence for or against the acceptance of the glacial control theory may be considered complete.

Recently, in his reading, the writer found an account of the physiography of the lower Amazon valley² to which it seems worth while to call attention for the benefit of any who may undertake an investigation of the evidences of strand-line displacements in the tropics.

A brief abstract of a portion of Smith's paper follows: All of the larger rivers entering the lower Amazon from the south, and the Trombetas entering from the north, have lake-like expanses in their lower courses into which the Amazon, at times of flood, is pouring silt which is gradually filling them up. Meanwhile the upper ends of the estuaries are being filled by their own rivers. Some of the latter, which are muddier than others, have already trans-

¹ Daly, R. A., "The Glacial Control Theory of Coral Reefs," *Proc. Am. Acad. of Arts and Sciences*, Vol. 51, 1915, 157-251. Davis, W. M., "A Shaler Memorial Study of Coral Reefs," *Am. Jour. Sci.*, 4th ser., Vol. 40, 1915, 223-271. Vaughan, T. Wayland, "The Platforms of Barrier Coral Reefs" (abs.), *Am. Geog. Soc. Bull.*, Vol. 46, 1914, pp. 426-429.

² Smith, H., "Physical Geography of the Amazon Valley," *Am. Nat.*, Vol. XIX., 1885, 27-37.

formed their former estuaries into alluvial plains above which rise scattered rocky islands. This is particularly true of the northern tributaries of the lower Amazon, except the Trombetas, which has relatively clear water, and has not yet filled its estuary.

The author suggests that the physiographic features described above may be interpreted as the result of a moderate drowning of the region followed by the filling up of the estuary of the Amazon by the heavy silt burden borne by that river:

Gradually the alluvial land at the head of the bay extended eastward, filling up the estuary with islands. As this eastward movement went on, the branch estuaries were blocked up at their mouths by islands which formed in front of them. Where the branch received a muddy tributary it also filled up; but the clear water tributaries like the Tapajós, Xingú, and Trombetas, brought down no sediment, and their estuaries, closed at the mouths, assumed the form of lakes.

That the phenomena described are the result of changes in level and not merely of the ponding of the tributaries by sediment from the Amazon, is indicated, as the author points out, by the fact that the Tocantins River, which enters the sea directly, has a similar estuary.

The physiographic phenomena here described seem to point to a relatively recent period of lowered sea level (or land uplift) followed by a rise to the present position (or a sinking of the land). The phenomena may have been associated with the changes in sea level postulated by Daly, or they may be due to local crustal movements. Physiographic studies of a large number of tropical rivers would go far toward solving the problem.

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QUOTATIONS

A PIONEER IN PHYSICS

FORTY-SEVEN years of collegiate teaching constitute in themselves a sufficient title to honor, even though their number be only a record of faithful and continuous service. When the passing of these years has told also a story of

important pioneer work, of purposeful achievement and steady progress, it becomes a record to conjure with. Of such is the repute that Professor Charles R. Cross has established in the long period of his association with the Massachusetts Institute of Technology, and of such the honor which the institute and all men are glad to accord him as he now lays hold upon the satisfactions of a well-earned retirement. Being graduated from Massachusetts Institute of Technology in 1870, with the third class that went out from its halls, Professor Cross forthwith returned after the summer vacation to take up an instructorship in the department of physics. Upon completing a single year of this service he was made an assistant professor and by 1878 had been given rank as a full professor. In 1886 he became director of the Rogers laboratory and in 1907 was made head of department. It is the threefold mantle of these responsibilities which he wears to-day and which he now contemplates laying aside.

Such accumulated funds of loyalty to his institution, of prestige not only in its counsels but in the scientific world at large, and such skill of investigation and analysis as Professor Cross has acquired, constitute a tangible fortune which might well be assessed only for its large present values. Yet if one is to take his career in review, there must be observed in particular the contribution Professor Cross made to the establishment of electrical engineering as an independent department of modern scientific and technical training. In the early eighties, some time before the wondrous expansion in the practical uses of electricity had generally been foreseen, Professor Cross prophesied it and insisted on electrical studies as part of his teaching in physics. He offered them long before they were taken up by other educators throughout the country, he developed their technique and bore the brunt of a pioneer's labor. Later it was at his instance that Technology introduced the first courses leading to a degree in electrical engineering ever offered in America. All through this development, his influence made for the increasing use and effectiveness of experiments in the illus-